DOCUMENT RESUME

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ABSTRACT

In this activity, students learn how paper is made by working together to make their own paper. Students are introduced to the concept of recycling: what it is, its importance, and how it affects their lives. This activity is uses a time frame of 40 minutes. (Author/SOE)

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Activity: **Make Your Own Recycled Paper**

GRADE LEVELS: pK-2

SUMMARY:

Students will learn about how paper is made. Working together, students will make their own paper. This activity introduces students to recycling; what it is, its importance, and how it effects their lives.

LEVEL OF DIFFICULTY

5-most difficult

TIME REQUIRED

one 40-minute class

COST

$5-$10 per class

STANDARDS:

1.1 Identify and describe characteristics of natural materials (e.g. wood, cotton, fur, wool) and human made materials (e.g. plastic, Styrofoam).

1.2 Identify some possible uses and advantages for natural materials (e.g. wood, cotton, fur, wool) and human-made materials (e.g. plastic, Styrofoam).

WHAT WILL THE STUDENTS LEARN?

How paper is made.

How new paper can be made from old used paper.

The importance of recycling.

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BACKGROUND INFORMATION:

Recycling: the act of processing used or abandoned materials for use in creating new products*

Paper is made mostly from wood. There are also several chemicals added to paper that make it more durable. While recycling paper does help to cut down the number of trees that need to be harvested, recycling also helps to decrease the amount of trash that goes into our nation's landfill each year.

New paper is made by taking timber and removing the bark from it. This wood is then cut into small chips. The small fragments are then pressure cooked as chemicals are added. The paper then goes through the processes of cleaning, refining, and bleaching turning the paper into a fine slush. The slush is then pumped onto a wire screen where it dries and becomes a continuous sheet of paper.

In a big recycling factory, mostly newspaper and cardboard boxes are recycled. The used paper is put through the process of deinking and then placed into a huge blender with water and beaten until the paper is broken down into small fibers. Then the fibers are pressed in screens to take the water out, flattened, and dried to make paper.

RESOURCES:

www.ibfsrp.com/making_paper.html - for a description on how paper is made

www.ppic.org.uk/htdocs/paper/process.htm - diagram on the papermaking process (both new and recycled)

MATERIALS: (For each group)

Wire mesh screen (cut to be smaller than the cake pan)

Toilet paper (single ply will break down faster)

Mixing bowl

Rectangular cake pan

Metal fork (or Blender)

Rolling pin

paper towels or newspapers

PREPARATION:

Assemble materials

Lay paper towels on the table

DIRECTIONS:

Talk with the students about recycling and discuss why recycling is important.

Arrange the students into groups. Have the students collect the materials and set up their workstations

1. Fill a bowl 3/4 full with warm water. Tear the toilet paper into small pieces and place them into the water. Beat the mixture with either a fork or a blender, until the paper is broken down into fibers. Pour the mixture into the cake pan.

2. Make a frame from the screen by folding the edges over. Slide the frame into the pan from the side so it is under the fibers. Lift the screen straight up through the water. It should be covered in fibers.

3. After the water has stopped dripping, place the screen on some paper towels or newspaper. Fold the paper towels over the screen so that the fibers are covered. Press with the rolling pin to remove any excess water.

4. Remove the paper towels and allow the paper to dry.

5. Once it is completely dry remove it from the screen and a new sheet can be made.

INVESTIGATING QUESTIONS:

How is paper made?

What is paper made of?

Why do we need to recycle paper?

What happens to the pieces of tissue when you add water? When you mix it?

What does the paper look like when it begins to dry?

What other materials could be used to make paper?

How would you make colored paper?

What would you do differently to make your paper better?

How would you use the paper that was made?

Why would you want to make new paper from used paper?

REFERENCES:

Rubric for Performance Assessment						
Activity Title:	Make your own Recycled Paper			Grade Level		
	1	2	3	4		
Criteria	Beginning	Developing	Proficient	Advanced	Weight (X factor)	Subtotal
UNDERSTANDING	Student did not seem to understand the concept of recycling.	Student needs to learn more about recycling.	Student seemed to understand concept of recycling.	Student was enthusiastic and creative about recycling.		
ACTIVITY/ TEAMWORK	Student did not work with the group in making the paper.	Student helped slightly, but did not work well with the group.	Student participated in most of the group work.	Student worked well in the group and played an active role in making the paper.		
					Total:	
Teacher Comments:						

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PreK-12
ENGINEERING

Activity Evaluation Form

www.k12engineering.org

Activity Name: _____

Grade Level the Activity was implemented at:

Was this Activity effective at this grade level *(if so, why, and if not, why not)?*

What were the Activity's strong points?

What were its weak points?

Was the suggested Time Required sufficient (if not, which aspects of the Activity took shorter or longer than expected)?

Was the supposed Cost accurate (if not, what were some factors that contributed to either lower or higher costs)?

Do you think that the Activity sufficiently represented the listed MA Framework Standards (if not, do you have suggestions that might improve the Activity's relevance)?

Was the suggested Preparation sufficient in raising the students' initial familiarity with the Activity's topic (if not, do you have suggestions of steps that might be added here)?

If there were any attached Rubrics or Worksheets, were they effective (if not, do you have suggestions for their improvement)?

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I. DOCUMENT IDENTIFICATION:

Title: PreK-12 Engineering Activities

1) Touch and Discover, Grades PreK-2
http://www.prek-12engineering.org/data/d2/Touchdiscover.pdf

2) Invent a Backscratcher from Everyday Materials, Grades PreK-2
http://www.prek-12engineering.org/data/d28/Backscratcher.pdf

3) Compare Human-Made Objects with Natural Objects, Grades PreK-5
http://www.prek-12engineering.org/data/d34/HumanvsNatural.pdf

4) Do Different Colors Absorb Heat Better?, Grades PreK-2
http://www.prek-12engineering.org/data/d37/Absorbheat.pdf

5) Which Roof is Tops?, Grades PreK-2
http://www.prek-12engineering.org/data/d44/RoofTops.pdf

6) Make Your Own Recycled Paper, Grades PreK-2
http://www.prek-12engineering.org/data/d56/Recycle.pdf

7) Build an Approximate Scale Model of an Object Using LEGOs, Grades 3-5
http://www.prek-12engineering.org/data/d3/LegoScaleModel.pdf

8) Design Weather Instruments using Lego Sensors, Grades 3-5
http://www.prek-12engineering.org/data/d4/LegoWeather.pdf

9) Space Shelter, Grades 3-5
http://www.prek-12engineering.org/data/d5/SpaceShelter.pdf

10) Build a Bird House, Grades 3-5
http://www.prek-12engineering.org/data/d6/BirdHouse.pdf

11) Ball Bounce Experiment, Grades 3-5
http://www.prek-12engineering.org/data/d6/BallBounce.pdf

12) Make an Alarm!, Grades 3-5
http://www.prek-12engineering.org/data/d11/MakeAlarm.pdf

13) Design Packing to Safely Mail Raw Spaghetti, Grades 3-5
http://www.prek-12engineering.org/data/d17/MailSpaghetti.pdf

14) Disassemble a Click Pen, Grades 3-5
http://www.prek-12engineering.org/data/d33/clickPen.pdf

15) Construct And Test Roofs for Different Climates, Grades 3-5
http://www.prek-12engineering.org/data/d35/ClimateRoof.pdf

16) Compare Fabric Materials, Grades 3-5
http://www.prek-12engineering.org/data/d36/Fabric.pdf

17) A House is a House for Me, Grades 3-5
http://www.prek-12engineering.org/data/d52/House.pdf

18) Water Filtration, Grades 3-5
http://www.prek-12engineering.org/data/d53/Water Filtration.pdf

19) What is the Best Insulator: Air, Styrofoam, Foil, or Cotton?, Grades 3-5
http://www.prek-12engineering.org/data/d54/BestInsulator.pdf

20) Design a Recycling Game!, Grades 3-5
http://www.prek-12engineering.org/data/d55/Recycling.pdf

21) Tower Investigation and the Egg, Grades 6-8
http://www.prek-12engineering.org/data/d7/TowerEgg.pdf

22) Wimpy Radar Antenna!, Grades 6-8
http://www.prek-12engineering.org/data/d10/WimpyAntenna.pdf

23) Portable Sundial, Grades 6-8
http://www.prek-12engineering.org/data/d30/PortableSundial.pdf

24) An Introduction To Loads Acting on Structures, Grades 6-8
http://www.prek-12engineering.org/data/d31/IntroLoads.pdf

25) Design Your Own Rube Goldberg Machine, Grades 6-8
http://www.prek-12engineering.org/data/d32/RubeGoldberg.pdf

26) Building Tetrahedral Kites, Grades 6-8
http://www.prek-12engineering.org/data/d38/tetrakites.pdf

27) Do as the Romans: Construct an Aqueduct!, Grades 6-8
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http://www.prek-12engineering.org/data/d41/Parachute.pdf

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http://www.prek-12engineering.org/data/d42/Squeeze.pdf

31) Stop The Stretching, Grades 6-8
http://www.prek-12engineering.org/data/d43/StopStretching.pdf

32) Speaker Project, Grades 9-10
http://www.prek-12engineering.org/data/d13/Speaker.pdf

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